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GB 2165154 A WO 92/15338 A1 US 4374571 A

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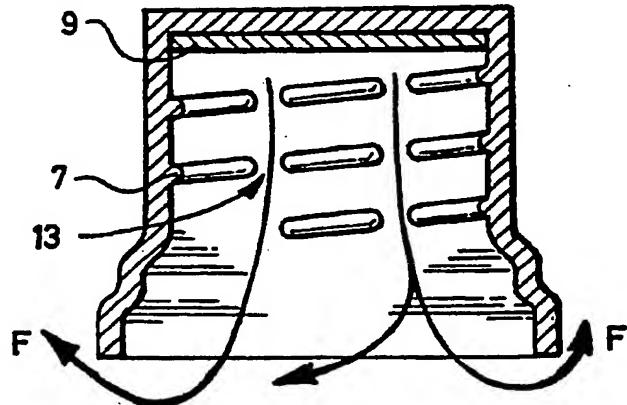
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## (54) Chemical vapour dispenser

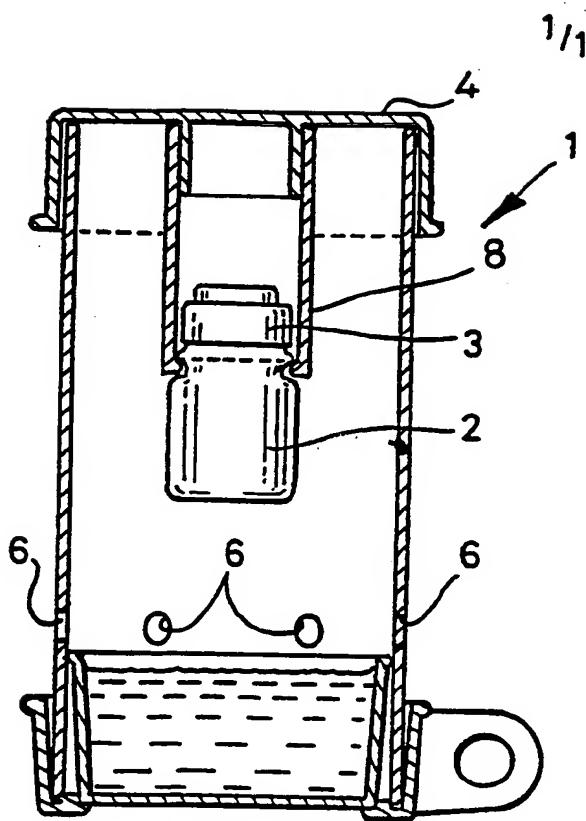
(57) A method of dispensing a chemical vapour comprises the steps of: providing a container bottle for the source of vapour having a screw-on cap, the cap having seal means (9) there within to seal against the bottle, the bottle and cap having retaining means (7) thereon to hold the cap captive on the bottle at least during an initial stage of unscrewing of the cap from the bottle to allow a limited passageway (13) for vapour to be formed between the bottle and the seal and between the co-operatively engaging screw threads of the cap and the bottle so that when the cap is unscrewed within its freedom of captive movement, chemical vapour from within the bottle may be released at a suitable slow rate; and deploying the bottle for use with the cap so-unscrewed.



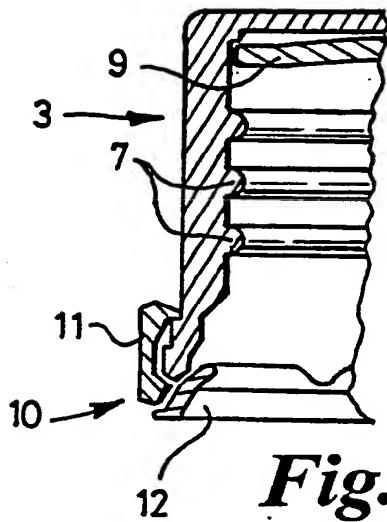
**Fig. 4**

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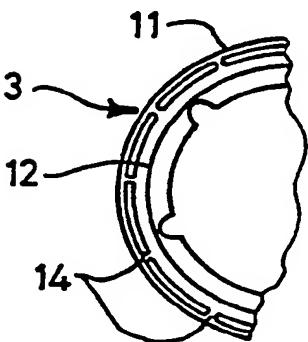
At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.



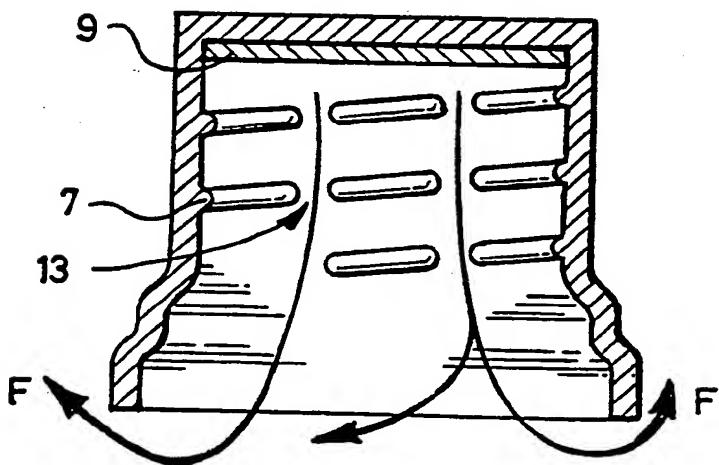
**Fig. 1**



**Fig. 2**



**Fig. 3**



**Fig. 4**

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### CHEMICAL VAPOUR DISPENSER

#### Field of the Invention

The present invention relates to a method for dispensing chemical vapour and a chemical vapour dispenser which are most especially, but not necessarily exclusively, applicable for dispensing chemical attractant vapour for use in fly traps and the like.

#### Background to the Invention

Release of chemical attractants by fly traps is necessarily slow rate to maximise longevity of the stored supply of chemical attractant. This is especially true of field traps for flies which may only be serviced on a very infrequent basis. Furthermore, the nature of the chemical attractant is such that only very small volumes of it can economically be used in a given trap and hence slow release rate is desirable for economy of use. Additionally, the generally toxic nature of the chemical attractant demands care in the construction and deployment of the dispenser.

Some conventional vapour dispensers make use of storage bottles having removable caps and a septum, or diaphragm, of porous material or being punctured to allow slow release of the chemical attractant vapour from the supply stored within the bottle. Such dispensers do, however, provide inadequate control of the rate of release and require full removal of the lid which may result in contamination of the user or some spillage when setting up the trap.

The general objective of the present invention is to provide an improved method and means for safely controllably dispensing a chemical vapour.

Summary of the Invention

According to a first aspect of the present invention there is provided a method of dispensing a chemical vapour which comprises the steps of:  
5 providing a container bottle for the source of vapour having a screw-on cap, the cap having seal means therewithin to seal against the bottle, the bottle and cap having retaining means thereon to hold the cap captive on the bottle at least during an initial stage of unscrewing of the cap from the bottle to allow formation of a limited passageway for vapour between the bottle and the seal and between the co-operatively engaging screw threads of the cap and the bottle so that when the cap is unscrewed within its freedom of captive movement, chemical vapour from within the bottle may be released at a suitable slow rate; and deploying the bottle for use with the cap so-  
10 unscrewed.  
15

According to a second aspect of the present invention there is provided a chemical attractant vapour dispenser which comprises a container bottle containing a source of chemical attractant vapour and having a screw-on cap, the cap having a seal means therewithin to seal between the cap and bottle,  
20 said bottle and cap having retaining means thereon to hold the cap captive on the bottle at least during an initial stage of unscrewing of the cap from the bottle to allow a limited passageway for vapour to be formed between the co-operatively engaging screw threads of the cap and the bottle so that when the cap is unscrewed within its freedom of captive movement, chemical vapour from within the bottle may be released at a suitable slow rate.  
25

Preferably the passageway is formed substantially along the threads by the gap between the respective co-operatively engaging threads of the cap and bottle.

30 Preferably the passageway comprises, at least in part, at least one bypass channel through at least part of the co-operatively engaging screw threads of

the cap and bottle.

Advantageously the seal means is formed of a non vapour absorbing material, which is preferably also resistant to chemical attack. Preferably it is at least resistent to chemical attack by the source of vapour.

5 Preferably the seal means comprises a liner sheet which lines the internal end wall of the cap.

Suitably the bottle and or the cap have marking means thereon for enabling the stage of opening of the cap from the bottle to be judged.

10 Preferably the marking means comprise spaced apart points or zones of the co-operatively engaging screw threads of the cap and or bottle at which notable resistance in the unscrewing of the cap from the container occurs.

Brief Description of the Drawings

15 Two preferred embodiments of the present invention will now be more particularly described, by way of example, with reference to the accompanying drawings, wherein:

Figure 1 is a diagrammatic cross-sectional view of a field trap for flies, adapted to carry a chemical attractant dispenser in accordance with the method embodying the present invention;

20 Figure 2 is a detailed part cross-sectional view of a cap for the chemical attractant dispenser;

Figure 3 is a partial plan view of the cap of figure 2, from below; and

Figure 4 is a cross-sectional view of a second embodiment of dispenser bottle cap.

Description of the Preferred Embodiment

Referring to figure 1, there is shown a species-selective field trap for flies which comprises a receptacle 1 having a removable lid 4. The receptacle forms a substantially closed chamber when the lid is in place, within which a source of chemical attractant vapour, for example allyl isothiocyanate, attractive to the selected species of fly and unattractive to most other species of fly is positioned in use. A number of lateral apertures 6 in the side walls of the receptacle 1 allow exit of the attractant vapour and allow entry of the fly as it follows the plume of attractant vapour into the trap. Water or other fluid within the base of the trap drowns the fly but maintains the humidity within the trap to prevent desiccation of the fly to enable subsequent effective species identification and counting of the number of flies for use in population analysis.

In contrast to the dispenser for chemical attractant described and illustrated in United Kingdom patent application No GB 2 262 699, the present invention proposes the use of a septum-less tamper-proof bottle 2 of generally known type, of which the screw-on cap has a seal therewithin and may be unscrewed to a predetermined point and may not be further unscrewed without supplying a substantially greater force. With such a bottle 2, the cap or lid 3 of the bottle 2 may be repeatedly unscrewed to the predetermined point to provide a passageway of broadly predetermined dimensions for slow release of the chemical attractant vapour from within the bottle 2 without removing the lid 3 altogether.

As illustrated, the container 2 is mounted within the receptacle 1 in an upright state by fitment of the container 2 into a snap-fit mounting 8 extending downwardly from the inner surface of the lid 4 of the receptacle 1.

Turning to figures 2 and 3, the configuration of the lid 3 of the tamper-proof container 2 is shown in detail for clarity. The lid 3 has a plurality of screw thread ribs 7 to co-operatively engage with corresponding screw thread ribs and grooves on the neck of the bottle 2 and has a liner 9 to provide a seal between the bottle 2 and cap 3. The rim 5 of the lid 3 has a frangible collar

10 fitted thereto. The collar 10 comprises an outer ring 11 and an inner ring 12 which respectively fit around the outer and inner faces of the cap rim 5 and are held together by frangible connectors 14. The inner ring 12 of the collar 10 is adapted to be trapped underneath an annular projection (not shown) on the neck of the bottle 2 such that when the cap is unscrewed to a predetermined point it may only be further unscrewed to be removed when the connections between the inner 12 and outer 11 rings of the collar 10 are broken through applying greater unscrewing force.

10 By using such tamper-proof bottles 2 of generally consistent screw thread dimensions a relatively consistent low rate of dispensing may be achieved with great ease and minimal risk of spillage and exposure of the operator to the generally toxic chemical contents of the bottle 2.

15 To install and activate the bottle 2, the lid 4 of the receptacle 1 is simply removed and the lid 3 of the bottle 2 unscrewed to the maximum extent of captive movement and the bottle 2 then mounted within the mounting 8 of the lid 4 of the receptacle 1 and the lid 4 replaced on the receptacle 1.

20 By unscrewing the lid 3 of the bottle 2 as proposed the upper rim of the neck of the bottle 2 will separate from the liner 9 allowing release of vapour from the bottle 2 which may then pass between the co-operatively engaging screw threads of the cap 3 and bottle 2 along those threads to be emitted therefrom via the gaps between the frangible connectors 14 of the cap 2.

25 In an alternative embodiment illustrated in Figure 4 a suitably select number and dimension of bypass channels 13 have been formed through the screw thread ribs 7 of the cap 2 to provide a passageway that is not dependant upon the tolerancing of the fit between the co-operatively engaging screw threads since it bypasses them. This will enhance control over the rate of emission and allow a greater range of emission rates.

30 The bottle and or the cap suitably have marking means thereon for enabling the stage of opening of the cap from the bottle to be judged which may comprise gradations on one or other or both of the cap and bottle or spaced

apart points or zones of the co-operatively engaging screw threads of the cap and or bottle at which notable resistance in the unscrewing of the cap from the container occurs.

CLAIMS

1. A method of dispensing a chemical vapour which comprises the steps  
of: providing a container bottle for the source of vapour having a screw-on  
cap, the cap having seal means there within to seal against the bottle, the  
bottle and cap having retaining means thereon to hold the cap captive on the  
bottle at least during an initial stage of unscrewing of the cap from the bottle  
to allow formation of a limited passageway for vapour between the bottle and  
the seal and between the co-operatively engaging screw threads of the cap  
and the bottle so that when the cap is unscrewed within its freedom of  
captive movement, chemical vapour from within the bottle may be released  
at a suitable slow rate; and deploying the bottle for use with the cap so-  
unscrewed.

2. A chemical attractant vapour dispenser which comprises a container  
bottle containing a source of chemical attractant vapour and having a screw-  
on cap, the cap having a seal means therewithin to seal between the cap and  
bottle, said bottle and cap having retaining means thereon to hold the cap  
captive on the bottle at least during an initial stage of unscrewing of the cap  
from the bottle to allow a limited passageway for vapour to be formed  
between the co-operatively engaging screw threads of the cap and the bottle  
so that when the cap is unscrewed within its freedom of captive movement,  
chemical vapour from within the bottle may be released at a suitable slow  
rate.

3. A chemical vapour dispenser as claimed in Claim 2, wherein, the  
passageway is formed substantially along the threads by the gap between the  
respective co-operatively engaging threads of the cap and bottle.

4. A chemical vapour dispenser as claimed in Claim 2 or 3, wherein the  
passageway comprises, at least in part, at least one bypass channel through at  
least part of the co-operatively engaging screw threads of the cap and bottle.

5. A chemical vapour dispenser as claimed in Claim 2, 3 or 4 wherein the  
seal means is formed of a non vapour absorbing material, which is preferably

also resistant to chemical attack.

6. A chemical vapour dispenser as claimed in any of Claims 2-5, wherein the seal means comprises a liner sheet which lines the internal end wall of the cap.

5 7. A chemical vapour dispenser as claimed in any of Claims 2-6, wherein the bottle and or the cap have marking means thereon for enabling the stage of opening of the cap from the bottle to be judged.

10 8. A chemical vapour dispenser as claimed in Claim 7, wherein the marking means comprise spaced apart points or zones of the co-operatively engaging screw threads of the cap and or bottle at which notable resistance in the unscrewing of the cap from the container occurs.

9. A method or apparatus substantially as hereinbefore described with reference to any suitable combination of the accompanying drawings.

9

**Patents Act 1977**  
**Examiner's report to the Comptroller under Section 17**  
 (The Search report)

Application number  
 GB 9425419.0

Search Examiner  
 J F JENKINS

Date of completion of Search  
 10 APRIL 1995

Documents considered relevant  
 following a search in respect of  
 Claims :-  
 1 to 9

**Relevant Technical Fields**

- (i) UK Cl (Ed.N) A5G (GV)  
 (ii) Int Cl (Ed.6) A61L 9/12

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE DATABASE: WPI

**Categories of documents**

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|----|---|----|---|
| X: | Document indicating lack of novelty or of inventive step.   | P: | Document published on or after the declared priority date but before the filing date of the present application.        |
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| A: | Document indicating technological background and/or state of the art.   | &: | Member of the same patent family; corresponding document.   |

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2165154 A	(RECKITT & COLMAN) see Figures 6 and 7	1-4
X	WO 92/15338 A1	(HAHN) see Figures 1a to 1c	1 and 2
A	US 4374571	(HIRVELA)	

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).

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